

Catalogue of American Amphibians and Reptiles.

PORTER, KENNETH R. 1970. *Bufo valliceps*.

***Bufo valliceps* Wiegmann**
Gulf Coast toad

Bufo valliceps Wiegmann, 1833:658. Type-localities, "Mexico" (Zool. Mus. Berlin 3525-3527) and "Vera Cruz, Mexico" (ZMB 3532); restricted to Veracruz, Veracruz, Mexico (Smith and Taylor, 1950). Syntypes (4 females, 1 male) collected by Ferdinand Deppe (not seen by author).

Bufo trachypus Weigmann, 1833:657, 658, footnote. Apparently the name under which specimens of *B. valliceps* were sold by the brother of Ferdinand Deppe and a *nomen nudum*.

Bufo granulatus Baird and Girard, 1852:173 (not of Spix, 1824). Type-locality, "between Indianola and San Antonio," Texas; restricted to San Antonio, Bexar County, Texas (Smith and Taylor, 1950). Holotype (male), U. S. Natl. Mus. 2595, collected by John H. Clark (examined by author).

Bufo nebulifer Girard, 1854:87. Replacement name for *granulosus* Baird and Girard which is preoccupied.

Bufo sternosignatus (part) Günther, 1858:68, 69. Type-localities, "Cordova" (British Mus. 56.3.17.25) and "Mexico" (BM 58.9.6.13). Syntypes (2 juveniles), BM 56.3.17.25, collected by Auguste Sallé, and 58.9.6.13, purchased from Émile Parzudaki, a dealer at Paris (not seen by author).

Chilophryne nebulifera: Cope, 1862:357. Emendation of *nebulifer* and transfer to genus *Chilophryne*.

Incilius nebulifer: Cope, 1863:50. Transfer of *nebulifer* to genus *Incilius*.

Bufo valliceps valliceps: Werner, 1896:350. First use of trinomial; this combination implied by reference to "Type" in description of *microtis*.

Bufo valliceps microtis Werner, 1896:350. Type-locality, "Honduras." Holotype, Zool. Mus. Berlin 13200, collected by S. Schluter.

Bufo valliceps macrocristatus Firschein and Smith, 1957:219. Type-locality, "between La Gloria and Cerro Azul," Oaxaca, Mexico. Holotype, Univ. Illinois Mus. Nat. Hist. 35583, collected by Thomas MacDougall, 24-26 March 1950.

Bufo valliceps wilsoni Baylor and Stuart, 1961:195. Type-locality, "Jacaltenango (ca. 50 air-line kilometers northwest of Huehuetenango), Huehuetenango, Guatemala." Holotype, Univ. Michigan Mus. Zool. 119391, collected by L. C. Stuart on 6 June 1955.

• CONTENT. No subspecies are recognized, see Comment.

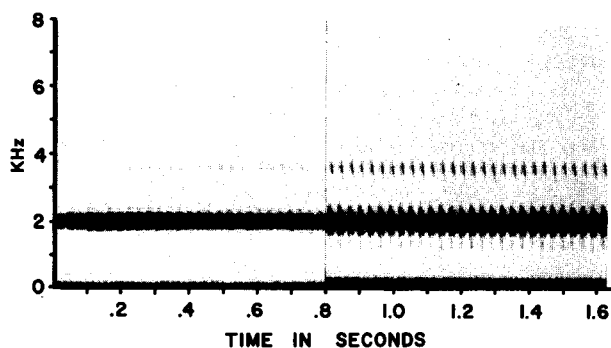
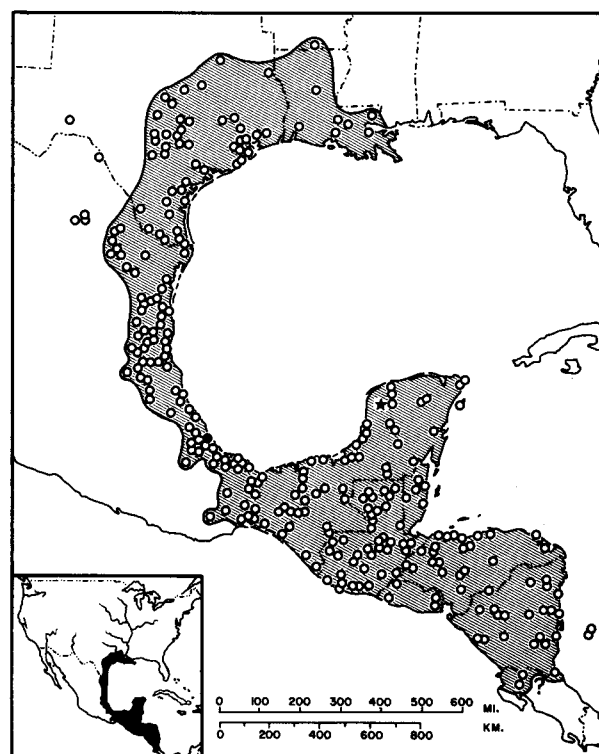


FIGURE. Audiospectrogram (narrow band, 45 cycles per second on left; wide band, 300 cycles per second on right) of part of mating call of *Bufo valliceps*: 7 mi. W Rincon, Veracruz, Mexico, 13 June 1964, body temperature 24°C (K. R. Porter recording).

• DEFINITION AND DIAGNOSIS. A member of the tropical and subtropical *Bufo valliceps* species group (Blair, 1966) with strongly developed cranial crests, that produce a deep concavity down the center of the head, and a linear series of prominent warts on each side of the body bounded above by a light stripe and below by a dark band; a light vertebral stripe is usually present; breeding males have a yellow-green throat. The parotoid glands are relatively small and subtriangular to ellipsoid. Body size varies geographically, medium in the north (females to 130 mm snout-vent), smaller in southern range (females to 75 mm snout-vent); males are smaller than females. The mating call is a trill with a carrier frequency that varies from about 1400 cps in the north to about 2100 cps in the south; its pulse rate changes about 2 notes per sec per degree centigrade change in body temperature and is about 38 notes per sec at 25°C (30-46); call length is variable (1-7 sec) but averages about 4 seconds. The dorsum of the tadpole tail musculature has 8-10 black bars with intervening areas of pale buff and there is an irregular black or brown band on the tail.

The combination of well-developed parietal cranial crests, a linear series of prominent warts on each side of the body bounded above by a light stripe and below by a dark band, and a light vertebral stripe will distinguish *Bufo valliceps* from any species with which it is sympatric. The similar *Bufo gemmifer* and *B. mazatlanensis* occur only on Pacific drainages of central and northern Mexico, are allopatric with *B. valliceps*, and have poorly developed parietal crests. *Bufo cavirostris*, whose range possibly overlaps that of *B. valliceps* at higher elevations in Mexico, lacks a distinct light stripe on the side of the body and has more elongated parotoid glands. *Bufo leutkeni*, possibly sympatric with *B. valliceps* in Middle America, has weak parietal crests and lacks a vertebral stripe. *Bufo coccifer* is sympatric with *B. valliceps* in Mexico and probably in Middle America but differs in having very short parietal crests, more spinous warts, spherical parotoid glands, and lacking the linear series of warts on each side of the body.



MAP. The solid symbol marks the type locality, open symbols indicate other records. The star marks a fossil locality.

Bufo ibarra tends to replace *B. valliceps* at higher elevations in Guatemala and differs in lacking lateral body stripes and in having very low parietal crests and generally more spinous warts. Both *B. coccifer* and *B. ibarra* tend to have very narrow vertebral lines rather than stripes as in *B. valliceps*. The enigmatic *Bufo cristatus*, known only from Jalapa, Veracruz, and Tezuitlán, Puebla, differs from *B. valliceps* in having much larger parotoid glands (20% of snout-vent length) and hypertrophied parietal and postorbital crests that fill the space between the parotoid gland and eye. The population of *B. valliceps* from the Cuautlapan region of Veracruz also has hypertrophied parietal crests but the postorbital crests are not expanded nor are the parotoid glands swollen. Other than the above mentioned species, no other sympatric toad is likely to be confused with *Bufo valliceps*.

• **DESCRIPTIONS.** General accounts are in Dickerson (1906), Wright and Wright (1949), and Conant (1958); details of adult morphology are in Kellogg (1932) and Porter (1964a, 1964b). Osteological descriptions are in Baldauf (1958), Sanders (1961), and Tihen (1962). A detailed description of tadpole development is in Limbaugh and Volpe (1957). Mating call parameters and variation are in Porter (1964b); the vocal apparatus is described by McAlister (1961). Venom constituents are described by Chen and Chen (1933), Barbier *et al.* (1961), Porter (1964c), and Wittliff (1964).

• **ILLUSTRATIONS.** Photographs of adults are in Dickerson (1906), Wright and Wright (1949), Conant (1958), Cochran (1961), and Porter (1964a). The dorsal surface of the head is photographed in Baylor and Stuart (1961); photographs of skulls are in Sanders (1961) and Tihen (1962). A lithograph of dorsal and ventral body surfaces is in Baird (1859); drawings of osteological features are in Baldauf (1958). Excellent drawings of all developmental stages through metamorphosis are in Limbaugh and Volpe (1957). A drawing of tadpole mouth parts is in Wright (1929).

• **DISTRIBUTION.** *Bufo valliceps* occurs on both Atlantic and Pacific drainages of Middle America from Bebedero (Wetstein, 1934) and the Rio Frio (USNM specimen 19581, examined by author) in extreme northern Costa Rica through the Isthmus of Tehuantepec; it is widespread along lowlands of the Gulf coast from the Isthmus of Tehuantepec to Louisiana and as far north as Calion, Arkansas (Smith and Langebartel, 1949); it is not present on the Pacific coast of Mexico west of the Isthmus of Tehuantepec nor on the Central Plateau; it is found primarily on lowlands but to nearly 1800 meters in moist habitats.

Important distributional data are in Noble (1918), Kellogg (1932), Smith (1938), Smith and Taylor (1948), Brown (1950), Milstead, Mecham, and McClintock (1950), Taylor (1953), Firschein and Smith (1957), Milstead (1960), Porter (1964a), and Lynch and Fugler (1965). Numerous other publications list collection localities. Habitat notes are in Dickerson (1906), Ruthven (1912), Brown (1950), Raun (1959), Duellman (1960, 1963, 1965), Blair (1960, 1961a), Baylor and Stuart (1961), Porter (1964a), and Reddell (1967).

• **FOSSIL RECORD.** Langebartel (1953) lists *B. valliceps* remains from Yucatan cave deposits that are of questionable age from very recent to Pleistocene. No other fossils have been assigned to this species.

• **PERTINENT LITERATURE.** Relationships to other species are discussed in Blair (1959, 1961b, 1963, 1964, 1966), Porter (1964a, 1964b, 1964c), and Porter and Porter (1967). Embryonic temperature tolerance and rates of development are discussed in Limbaugh and Volpe (1957), Volpe (1957), and Hubbs *et al.* (1963). Brattstrom (1963, 1968) has provided data on thermal requirements of adults. Notes on feeding habits are in Strecker (1937). Morphological variation is discussed in Blair (1941), Taylor and Smith (1945), Taylor (1949, 1952), Duellman (1960, 1963), Baylor and Stuart (1961), and Porter (1964a, 1964b). Population dynamics

were studied by Blair (1953) and Thornton (1960). Inter-specific mating and hybridization are discussed in Orton (1951), Liner (1954), Thornton (1955), Volpe (1956, 1959, 1960), and Blair (1956, 1959, 1961b, 1963, 1964, 1966). Gratzner and Allison (1960) mention the haemoglobin of *B. valliceps*. Chu and McCain (1969) studied learning in *B. valliceps*.

• **ETYMOLOGY.** The name *valliceps*, from Latin *vallis* (hol-low) and *caput* (head), refers to the median dorsal longitudinal concavity of the head produced by the high cranial crests.

COMMENT

A thorough study of geographical variation in *B. valliceps* is lacking and, consequently, the evaluation of subspecies is impossible. With the possible exception of *wilsoni*, a relatively local and slightly-differentiated population, none of the named subspecies is well-defined morphologically or geographically. The validity of *macrocristatus* as a populational entity is doubtful (Duellman 1960, Baylor and Stuart 1961, Porter 1964a). The type-locality of *microtis* is not well-defined and specimens from Honduras will key to *valliceps* (Lynch and Fugler, 1965).

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